

AC 135-7

DATE 10/24/78

ADVISORY CIRCULAR



DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration
Washington, D.C.

FAR GUIDANCE MATERIAL

Subject: FAR 135: ADDITIONAL MAINTENANCE REQUIREMENTS FOR AIRCRAFT
TYPE CERTIFICATED FOR NINE OR LESS PASSENGER SEATS

1. PURPOSE. This advisory circular (AC) provides information relative to establishing methods acceptable to the Administrator for compliance with the additional maintenance requirements of the Federal Aviation Regulations (FAR) Part 135 as amended for certain air taxi operators and commercial operators (ATCO).
2. FOCUS. The information contained in this AC applies only to ATCO that use aircraft that are type certificated, excluding any pilot seat, for nine or less passenger seats.
3. RELATED FAR PARTS 1, 23, 25, 27, 29, 33, 35, 43, 91, and 135.
4. DEFINITION. The term "maintenance," as used in this AC and in FAR Section 135.421, means inspection, overhaul, repair, preservation and the replacement of parts but excludes preventive maintenance, as defined in FAR Part 1.
5. RELATED READING MATERIAL. AC 135-3B, Air Taxi Operators and Commercial Operators Of Small Aircraft, contains additional information regarding certain aircraft inspections and air taxi operators' manuals referenced in this AC.
6. BACKGROUND. By amendment issued September 26, 1978, the Federal Aviation Administration (FAA) amended FAR Part 135 effective December 1, 1978. The amended FAR requires ATCO using aircraft that are type certificated, excluding any pilot seat, with nine or less seats, to comply with additional maintenance requirements for each aircraft engine, propeller, rotor, and each item of required emergency equipment. FAR Section 135.11(b)(2)(v), as amended, requires operators of those aircraft to list the additional maintenance requirements on their operations specifications. Prior to the amendment, FAR Part 135 only required an aircraft be inspected in accordance with the provisions of FAR Part 91 or an approved inspection program under Part 135. The amended rule, in addition to the inspection requirements, sets forth maintenance

Initiated by: AFS-830

requirements that may include the overhaul and replacement of parts at specified time intervals.

7. DISCUSSION. FAR Section 135.421 sets forth additional maintenance requirements for each aircraft engine, propeller, rotor, and each item of required emergency equipment. The manufacturer of an aircraft, aircraft engine, rotor or propeller is required by the FAR to make available a maintenance manual or maintenance instructions that it considers essential for the proper maintenance of its product. FAR Section 135.421 requires an ATCO to maintain this equipment in accordance with a maintenance program recommended by the manufacturer. FAR Section 135.421 also allows an ATCO to use a program other than the manufacturer's if it is approved by the Administrator. This provision allows an operator to utilize the experience it gains in maintaining this equipment to adjust inspection and overhaul times different than those recommended by the manufacturer of the referenced products.

a. The additional maintenance requirements in FAR Part 135 are in addition to the requirements set forth in FAR Parts 91 and 43. The additional maintenance requirements may be accomplished in accordance with other maintenance required by the FAR and are not intended to duplicate any present inspection requirements. In the majority of cases, the manufacturer's recommended maintenance program frequencies may be the same as those required by a specific FAR; e.g., FAR Section 91.169 requires an aircraft to have a 100-hour inspection when it is used to carry persons for hire. If a manufacturer's program recommends a 100-hour inspection, the inspection of the additional maintenance items and work may be performed along with the aircraft 100-hour inspection.

b. If a progressive inspection program has been established under FAR Section 91.171 or an inspection program required by FAR Section 91.217 or an approved aircraft inspection program under FAR Section 135.419, the ATCO may, after coordination with the FAA certificate holding district office, utilize those inspection periods in lieu of those recommended by the manufacturer. The FAA certificate holding office may, if time deviations are involved, approve the programs in lieu of the manufacturer's recommended program providing an operator supplies the proper justification with its request. The acceptance is usually based upon satisfactory service experience or industry experiences and a determination that the deviation will not adversely affect the airworthiness of the aircraft.

8. MANUFACTURER RECOMMENDED PROGRAMS.

a. A maintenance program for each aircraft engine, propeller, rotor, and each item of required emergency equipment may be a program that is recommended by the manufacturer of the aircraft or the manufacturer of the aircraft engine, rotor, propeller, or an item of emergency equipment.

b. The aircraft manufacturer's maintenance manual, in most cases, contains the frequency and the extent of maintenance necessary for the aircraft engine, propeller, and rotors. It may also include the frequency of overhauls and the life limit of components requiring replacement.

c. If the aircraft manufacturer's maintenance manual does not contain all the maintenance and inspection requirements, then the respective instructions issued by the manufacturer of the aircraft engine or propeller should be utilized. The manufacturer of the aircraft engine is required by FAR 33.5 and the manufacturer of the propellers is required by FAR Section 35.3 to provide instructions for the installation, servicing, and maintenance of its product.

d. The manufacturer of emergency equipment does not always provide maintenance programs with its equipment. However, in most cases, the manufacturer does recommend a maintenance program for its product. This program may, after review by the FAA certificate holding district office, be acceptable for use by an ATCO. Certain emergency equipment items such as an ELT and high pressure cylinders are required by FAR or other federal regulations to be maintained, inspected, and tested at specific periods. Those specified times should be included in an ATCO program for its emergency equipment.

9. PROGRAM APPROVED BY THE ADMINISTRATOR. FAR Section 135.421 provides for use of a program other than one recommended by manufacturer, if it is approved by the Administrator. This provision of the regulation allows a certificate holder to develop a program for each aircraft engine, propeller, rotor, and each item of emergency equipment.

a. An ATCO may request approval to use only parts of a manufacturer's recommended program. An ATCO may request an increase in the time between overhauls (TBO) or may request extension of specific inspection items to make those items compatible with an inspection program established for its aircraft.

b. Changes to time limitations are normally considered on the basis of satisfactory service experience or industry experience when sufficient justification can be furnished and that the changes will not adversely affect the airworthiness of the aircraft.

c. The inspection period established for emergency equipment should ensure that it is serviceable, that all components of the emergency equipment are complete, and it may be expected to remain in that condition until the next inspection or in actual use under an emergency condition.

d. Parts listed as life limited on the FAA type certificate data sheets, in the airplane flight manual, or other documents are not eligible for a time increase unless those times are revised by the FAA on the FAA-approved documents that sets forth the times for the replacement of those life limited parts.

10. OPERATIONS SPECIFICATIONS - AIRCRAFT MAINTENANCE. The requirement to show time limitations on operations specifications for the additional maintenance requirements is outlined in FAR Section 135.11(b)(2)(v).

FAR Section 135.421 requires that the ATCO use a program that is recommended by the manufacturer or use a program that is approved by the Administrator. The program that is used by an ATCO, in order to comply with FAR Section 135.11(b)(2)(v), should either be referenced or described on the ATCO'S operations specifications. The ATCO is responsible for developing the contents of its operations specifications and to submit them to the FAA for approval. An ATCO is encouraged to have preliminary discussions with FAA inspectors during the development or amendment of its operations specifications. In many instances, time and effort may be saved by informally resolving any items that could cause delay in the formal approval of operations specifications - aircraft maintenance. It is also acceptable to have the additional maintenance items that are included in accepted or approved inspection programs referenced on its operations specifications. When a referenced inspection program does not include all of the manufacturer's recommended checks, inspections, and overhaul time periods, those items may be included on its operations specifications. It is important that the documents and manuals that are referenced identify all of the required components. The figures shown in this AC are not intended to be all inclusive. They show examples of a significant number of variations that are available for an operator to use to develop its operations specifications - aircraft maintenance. Examples of those operations specifications can be found in Appendix 1 as follows:

a. Figure 5. Operations specifications indicating the inspection, checks, and overhaul are contained in the operator's approved aircraft inspection program for the aircraft it operates.

b. Figure 6. Operations specifications indicating the inspection and check are accomplished in accordance with a manufacturer's manual with a deviation from the prescribed overhaul time for the engine and its components.

c. Figure 7. Operations specifications indicating the inspection, check, and overhaul times are contained in the inspection program approved by the FAA in accordance with FAR Section 91.217(b)(5).

11. PREPARATION OF OPERATIONS SPECIFICATIONS. Operations specifications are prepared by the operator using FAA Form 1014, Operations Specifications. These forms are available from any FAA Flight Standards Field Office. A sample of the recommended format is shown in Figure 1. The following outline may be used as a guide:

a. The name of the operator should appear at the top of the page.

b. The specification page should identify the page as "Aircraft Maintenance - Nine Or Less Passengers, Additional Maintenance Requirements" as shown in Figure 1.

c. All pages are to be properly numbered and dated. Each operations specifications page should be numbered consecutively showing the total number of pages in each series of the specifications; i.e., page 1 of 4, page 2 of 4, etc.

d. The operator is responsible for submitting the information on the reverse side of FAA Form 1014 as indicated in Figures 2 and 3. During the initial application, the operator should indicate "original issuance." When an application is made for an amendment to an operations specifications, a time increase or the addition of an item, the operator should submit the reasons and supporting data for its request. An example of a justification statement is shown in Figure 3.

e. Operations specifications can either reference a manual (air taxi manual, manufacturer's manual, progressive inspection manual, etc.), or it may list its time limitations for overhauls, inspections, and checks of its aircraft engines, propellers, etc.

(1) When referencing a manufacturer's data, the manual or document should be identified by the manufacturer's code, symbol, chapter, and/or pages, or by any other traceable identifier. An example of an acceptable method is shown in Figure 1.

(2) An operator developing its own maintenance program is required to show the check, inspection, and overhaul time limits on the operations specifications as indicated in Figure 4. The items can be listed by referencing the major components of the ATA-100 code for the purpose of standardization as shown in Figure 4. As was mentioned earlier in this AC, an operator may request approval to deviate from specific parts of a manufacturer's program. In cases where a change has been justified, operations specifications may be approved.


J. A. FERRARESE
Acting Director
Flight Standards Service

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Appendix 1

APPENDIX 1. SAMPLE OPERATIONS SPECIFICATIONS - AIRCRAFT MAINTENANCE:
FOR USE BY ATCO

FIGURE 1. EXAMPLE OPERATIONS SPECIFICATIONS; AIRCRAFT MAINTENANCE - NINE OR LESS PASSENGERS: ADDITIONAL MAINTENANCE REQUIREMENTS PROGRAM BY REFERENCE TO MANUFACTURERS' DOCUMENTS

<div style="display: flex; justify-content: space-between;"><div>UNITED STATES OF AMERICA DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION WASHINGTON</div><div>Form Approved. OMB No. 04-R0075</div></div>
Page 1 of 1
<p>OPERATIONS SPECIFICATIONS DORO AVIATION SERVICE AIRCRAFT MAINTENANCE - NINE OR LESS PASSENGERS ADDITIONAL MAINTENANCE REQUIREMENTS CESSNA - 421</p>
<p>Aircraft operated by Doro Aviation Service shall not be utilized in air taxi/ commercial operator operations unless:</p> <ol style="list-style-type: none">1. The Teledyne Continental Motors engine model GTSIO-520C and its component parts, accessories, and appliance are maintained in an airworthy condition in accordance with the schedule of maintenance, inspection, and overhaul times set forth in Cessna Model 421 Service Manual D817-13, as amended, and the other manufacturers' service manual referenced therein as amended.2. The McCauley propeller model 3AF 34C-74 and its component parts are maintained in an airworthy condition in accordance with the schedule of maintenance, inspection and overhaul times set forth in the Cessna Model 421 Service Manual D817-13, as amended, and the other manufacturers' service manuals referenced therein as amended.3. The items of installed required emergency equipment are maintained in an airworthy condition in accordance with the schedule of maintenance inspection and overhaul functions set forth in the product manufacturer's service and overhaul instructions as follows: Lifevest - Pan Avion Overhaul Manual 310-9 Liferaft - Pan Avion Overhaul Manual 310-9 Oxygen Regulator - Scott Overhaul Manual H-137 *Oxygen Bottle - Scott Overhaul Manual H-120 Oxygen Mask - Scott Service Instructions *CO2 Extinguisher - Walter Kiddie Overhaul Manual, with Illustrated Parts List, Part No. 870904.4. Parts having retirement times are replaced as outlined in the Cessna Model 421 Service Manual D817-13, as amended, and on the FAA, Aircraft Type Data Sheet A7CE as revised, Engine Type Data Sheet E7CE as revised and Propeller Type Data Sheet P22E as revised. <p>*Inspections Test and Life Limits will be accomplished as set forth in Part 173, Chapter 1, Subtitle B of CFR 49, currently in effect.</p>
Effective date _____

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FIGURE 2. EXAMPLE OF REVERSE SIDE OF OPERATIONS SPECIFICATIONS,
FAA FORM 1014, ORIGINAL CERTIFICATION WITH FAA APPROVAL

FEDERAL AVIATION ADMINISTRATION

Washington, D. C.

Operating Certificate No. AEA-661

ABC Air Taxi, Inc. hereby makes application for amendment
of the Operations Specifications appearing on the reverse side hereof, as follows:

Original Issuance

Reasons and supporting data (if insufficient space attach additional page):

Meets the requirements of FAR 135

I CERTIFY that the statements submitted in connection herewith are true and that I am duly authorized
to make this application on behalf of the applicant.

Able B. Charlie

Able B. Charlie

(Signature)

Director of Maintenance

(Title)

Date January 1, 1979

INSPECTOR'S RECOMMENDATIONS:

(Signature)

(Title)

The Operations Specifications set forth on the reverse side hereof are approved.

Amendment No. Original

By direction of the Administrator:

I. M. Spector

I. M. Spector

(Signature)

Effective date January 1, 1979

Supersedes specifications dated

Principal Aviation Safety Inspector (AW)

AEA-GADO-10

(Title)

Received for the applicant by:

Able B. Charlie

Able B. Charlie

(Signature)

Director of Maintenance

(Title)

Date January 3, 1979

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**FIGURE 3. EXAMPLE OF REVERSE SIDE OF OPERATIONS SPECIFICATIONS,
FAA FORM 1014, REQUEST FOR INCREASE IN TIME LIMITATIONS,
WITH FAA APPROVAL**

FEDERAL AVIATION ADMINISTRATION
Washington, D. C.

Operating Certificate No. AEA-601.....

ABC Air Taxi, Inc. hereby makes application for amendment
of the Operations Specifications appearing on the reverse side hereof, as follows:

Increase the overhaul period of the Lycoming IO360 engine from 1200 hours to
1500 hours.

Reasons and supporting data (if insufficient space attach additional page):

The above increase is based on the satisfactory experience of 20 months of
operation and a tear down inspection of three engines (each 1200 hours) that
resulted in satisfactory findings and installation of improved bearing in
accordance with manufacturer's recommendations. This increase in TBO will not
adversely effect the airworthiness of those engines.

I CERTIFY that the statements submitted in connection herewith are true and that I am duly authorized
to make this application on behalf of the applicant.

Able B. Charlie

Able B. Charlie

(Signature)

Date January 1, 1979

Director of Maintenance

(Title)

INSPECTOR'S RECOMMENDATIONS:

(Signature)

(Title)

The Operations Specifications set forth on the reverse side hereof are approved.

Amendment No. 1

By direction of the Administrator:

I. M. Spector

Effective date January 3, 1979

I. M. Spector

(Signature)

Supersedes specifications dated January 1, 1978

Principal Aviation Safety Inspector (AW)

AEA-GADO-10

(Title)

Received for the applicant by:

Able B. Charlie

Able B. Charlie

(Signature)

Date January 4, 1979

Director of Maintenance

(Title)

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FIGURE 4. EXAMPLE OPERATIONS SPECIFICATIONS, AIRCRAFT MAINTENANCE -
NINE OR LESS PASSENGERS, ADDITIONAL MAINTENANCE
REQUIREMENTS/PROGRAM DEVELOPED BY OPERATOR

<div style="display: flex; justify-content: space-between;"><div style="text-align: center;"><small>UNITED STATES OF AMERICA DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION WASHINGTON</small></div><div style="text-align: right;"><small>Form Approved. OMB No. 04-R0075</small></div></div> <div style="text-align: right; margin-top: 5px;"><small>Page 1 of 3</small></div>
OPERATIONS SPECIFICATIONS DORO AVIATION SERVICE, INC. AIRCRAFT MAINTENANCE - NINE OR LESS PASSENGERS ADDITIONAL MAINTENANCE REQUIREMENTS CESSNA 182
<p>A. Aircraft operated by Doro Aviation Service shall not be utilized in air taxi/commercial operator operations unless the aircraft engine, propeller and required emergency equipment are maintained in an airworthy condition in accordance with the schedule of maintenance and inspection functions and procedures as outlined in these operations specifications.</p> <p>B. Parts or subcomponents not listed on these operations specifications will be checked and inspected and/or overhauled at the same time limitation specified for the aircraft engine and propeller.</p> <p>C. Inspection/check requirements. All work shall be accomplished in accordance with the applicable procedures as listed in these operations specifications, the Cessna Model 182 Service Manual D2006-C3-13 and other manufacturers' manuals referenced therein as amended.</p> <p style="margin-left: 40px;">"PF" Preflight to be accomplished each service calendar day.</p> <p style="margin-left: 40px;">"A" Inspection/check to be accomplished before exceeding sixty (60) hours time in service.</p> <p style="margin-left: 40px;">"B" Inspection/check to be accomplished before exceeding one hundred and twenty (120) hours time in service.</p> <p style="margin-left: 40px;">"C" Inspection/check to be accomplished before exceeding two hundred and forty (240) hours time in service.</p> <p>D. Note reference</p> <ol style="list-style-type: none">1. Replace every 120 hours time in service or every six months.2. Replace as required.3. Replace at engine overhaul or after five years.4. Replace as required each engine overhaul.5. Inspect and overhaul in accordance with Walter Kiddie Overhaul Manual with IPL, Part #870904.6. Inspect and overhaul in accordance with Scott Overhaul Manual H-137.7. Inspect and overhaul in accordance with Pan Avion Overhaul Manual 310-9. <p>E. Unless otherwise specified, all times are listed as hours of time in service.</p> <p style="margin-top: 20px;">Effective date _____</p>

FAA Form 1014 (2-72)

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Appendix 1

FIGURE 4. (CONT'D) EXAMPLE OPERATIONS SPECIFICATIONS, AIRCRAFT MAINTENANCE - NINE OR LESS PASSENGERS, ADDITIONAL MAINTENANCE REQUIREMENTS/PROGRAM DEVELOPED BY OPERATOR

UNITED STATES OF AMERICA DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION WASHINGTON		Form Approved OMB No. 04-R0075		
		Page 2 of 3		
OPERATIONS SPECIFICATIONS				
DORO AVIATION SERVICE, INC. AIRCRAFT MAINTENANCE - NINE OR LESS PASSENGERS ADDITIONAL MAINTENANCE REQUIREMENTS CESSNA 182				
	OVERHAUL PERIOD	PREFLIGHT INSPECTION	INSPECTION PERIODS	NOTE
<u>Vacuum/Pressure, Chapter 37</u>	1,700			
Vacuum oil separator			B	
<u>Powerplant, Chapter 71</u>	1,700			
Engine mount		X	C	4
Electrical harness		X	C	
Hoses			B	3
Metal lines & fitting		X	A	
<u>Engine Reciprocating, Chapter 72</u>	1,700	X	A	
Engines baffles		X	A	
Cylinders		X	B	
Crankcase		X	B	
<u>Ignition, Chapter 74</u>	1,700			
Ignition harness		X	B	
Sparkplugs		X	B	
<u>Engine Controls, Chapter 76</u>	1,700			
Engine controls and linkage		X	A	4
<u>Engine Exhaust, Chapter 78</u>	1,700			
Exhaust system		X	A	4
<u>Engine Oil, Chapter 79</u>	1,700			
Engine oil screen			A	
External, oil filter			A	1
Oil cooler		X	B	
<u>Equipment/ Furnishing, Chapter 25</u>				
First aid kit	6 months	X	B	
Lifvest and rafts	1 year	X	B	7
Pan Avion C-10-1				
Transmitter, emergency	6 months	X	B	
<u>Fire Protection, Chapter 26</u>				
Cylinders CO2*		X		5
Bottle weight check	6 months			
Effective date _____				

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FIGURE 4. (CONT'D) EXAMPLE OPERATIONS SPECIFICATIONS, AIRCRAFT
MAINTENANCE - NINE OR LESS PASSENGERS, ADDITIONAL
MAINTENANCE REQUIREMENTS/PROGRAM DEVELOPED BY OPERATOR

UNITED STATES OF AMERICA DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION WASHINGTON		Form Approved. OMB No. 04-R0075	
OPERATIONS SPECIFICATIONS		Page 3 of 3	
DORO AVIATION SERVICE, INC. AIRCRAFT MAINTENANCE - NINE OR LESS PASSENGERS ADDITIONAL MAINTENANCE REQUIREMENTS CESSNA 182			
	OVERHAUL PERIOD	PREFLIGHT INSPECTION	INSPECTION PERIODS
			NOTE
<u>Oxygen, Chapter 35</u>			
Bottle, oxygen*			
Regulator, oxygen flow	6,000	X	B 6
<u>Propeller, Chapter 61</u>	1,200		
Spinner		X	A
Spinner bulkhead		X	C
Blades		X	A
Bolts & nuts		X	C
Hub		X	C
Governor & control		X	C
<u>Powerplant, Chapter 71</u>	1,700		
Induction air filter		X	A 2
Induction air box, air valves		X	B
doors and controls			
Cold and hot air hose		X	C
Intake system		X	A
Engine shock mounts, mount		X	C
structure and ground straps			
*Hydrostatic and life limits will be accomplished as set forth in Part 173, Chapter 1, Subtitle B of CFR 49 currently in effect.			
Effective date _____			

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FIGURE 6. EXAMPLE OPERATIONS SPECIFICATIONS - AIRCRAFT
MAINTENANCE - NINE OR LESS PASSENGERS - LISTING OF
MANUFACTURERS' MAINTENANCE PROGRAMS WITH DEVIATIONS
FROM SPECIFIC OVERHAUL TIMES

<small>UNITED STATES OF AMERICA DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION WASHINGTON</small>	<small>Form Approved. OMB No. 04-R0075</small>						
Page 1 of 1							
OPERATIONS SPECIFICATIONS ABC AIR TAXI, INC. AIRCRAFT MAINTENANCE - NINE OR LESS PASSENGERS ADDITIONAL MAINTENANCE REQUIREMENTS CESSNA 421							
<p>The Teledyne Continental Engine Model GTSIO-520C and its components, parts, accessories and the McCauley Propeller Model 3AF-34C-74 installed in ABC Air Taxi, INC., Cessna 421 aircraft, shall not (except as listed below) be used in operations under FAR Part 135 unless they are maintained in accordance with the schedule of maintenance and overhaul times set forth in Chapter 2 of the Cessna Model 421 Service Manual D817-13 and other manufacturers' manuals referenced therein as amended.</p> <table style="margin-left: auto; margin-right: auto;"><tr><td></td><td style="text-align: center;"><u>Overhaul</u></td></tr><tr><td>Aircraft Engine - GTSIO-520C</td><td style="text-align: center;">1700 hrs.</td></tr><tr><td>Propeller 3AF-34C-74</td><td style="text-align: center;">1700 hrs.</td></tr></table> <p>Related Parts or subcomponents listed in the Cessna Service Manual that require overhaul will be overhauled at the same aircraft time limitations specified for the aircraft engine and propeller.</p>			<u>Overhaul</u>	Aircraft Engine - GTSIO-520C	1700 hrs.	Propeller 3AF-34C-74	1700 hrs.
	<u>Overhaul</u>						
Aircraft Engine - GTSIO-520C	1700 hrs.						
Propeller 3AF-34C-74	1700 hrs.						
Effective date _____							

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